Delta Water Quality

The water quality in the Bay-Delta is insufficient to meet the beneficial uses of the Delta water. At times, water quality standards have not been met and contaminants have been found in some fish and wildlife species triggering public health warnings. The major problems can be categorized by water use as follows:

A. **Water quality** is often inadequate or is perceived as inadequate for **drinking** water needs as shown below:

1. Increased **particulates, carbon,** and **nutrients** in water supplies affect treatability of drinking water quality.

   a) The treatment of water (with the use of chlorine in the disinfection process) containing high levels of **total organic carbon** results in increased levels of disinfection **by-products,** such as chloroforms.

   b) Increased nutrient levels can trigger algae blooms resulting in **taste and odor** problems as well as clogged filters at treatment facilities.

   c) Seasonal and localized high **turbidity** levels increase treatment costs and risks of contaminants slipping through treatment process.

   d) Increased **toxicity of suspended sediments** may pose an increased risk of contaminants requiring treatment.

2. Increased levels of **pollutants and metals** in water supplies affect treatability of drinking water and may have an adverse impact on taste and odor.

   a) The presence of **pesticide** residues may adversely affect human health if not adequately treated.

   b) The presence of **herbicide** residues may adversely affect human health if not adequately treated.

   c) The presence of **hydrocarbon** residues affect the treatability of drinking water.

   d) The presence of **heavy metals** may adversely affect human health if not adequately treated.

   e) The increased risk of **hazardous material spills** into drinking water supplies may impact treatability and availability of water.

3. The large quantities of **Delta water used** within and outside of the Delta may contribute to water quality problems by altering natural flow patterns.

   a) The treatment of water (with the use of ozone in the disinfection process) with minute concentrations of **bromide** results in increased levels of brominated disinfection by-products.

   b) Increased levels of **salinity** in surface and groundwaters can create adverse taste conditions due to the salt content of the water and may exceed water quality standards.

   c) The **low** water levels of **Delta inflows** can exacerbate water quality problems.

Revised: August 15, 1995

E-011271

4. **Other parameters** of concern in water supplies as well as institutional arrangements contribute to the difficulty of maintaining adequate water quality for drinking water.

   a) Increased presence of **pathogens** (virus, bacteria, protozoa, etc.) increases treatment requirements and costs and pose an increased risk to consumers.

   b) The presence of **asbestos** fibers (long fibers are of concern) may increase treatment costs and may increase risk to human health.

   c) The **complex** array of **water quality standards** for a wide variety of uses (drinking water, agriculture, aquatic habitat, recreation, and industrial uses) can increase the difficulty in maintaining water quality for all beneficial uses.

B. **Water quality** is often inadequate for **agricultural** irrigation and operational needs as shown below:

1. Increased **particulates** in water supplies affect agricultural operations.

   a) Increased seasonal and localized **turbidity** levels may result in the need for filtration before water can be used with some irrigation methods.

   b) Increased ***toxicity of suspended sediments*** may pose an increased risk when used on food crops.

2. Increased levels of **pollutants and metals** in water supplies may have an adverse impact on soils, crops, and runoff.

   a) The presence of **hydrocarbon** residues may impact the quality of irrigation waters.

   b) The presence of **heavy metals** may impact crop production and quality.

   c) The increased risk of **hazardous material spills** into waters used for irrigation may impact agricultural operations and availability of water.

3. The large quantities of **Delta water** used within and outside of the Delta contribute to water quality problems by altering natural flow patterns.

   a) Increased levels of **chloride** decrease the desirability for irrigation use because of direct impacts of chloride on some crops.

   b) The **low** water levels of **Delta inflows** can exacerbate water quality problems.

4. **Other parameters** of concern and institutional arrangements contribute to the difficulty of maintaining adequate water quality for agricultural uses.

   a) **Water quality standards** to meet one beneficial use may be in conflict with another beneficial use.

C. **Water quality** is often inadequate for **industrial** needs as shown below:

1. Increased levels of **pollutants and metals** in water supplies may have an adverse impact on industrial requirements.

   a) The presence of **hydrocarbon** residues may affect the use of water in industrial processes.

b) The presence of **heavy metals** may affect the use of water in industrial processes.

c) The increased risk of **hazardous material spills** may impact industrial operations and the availability of water.

2. The large quantities of **Delta water used** within and outside of the Delta contribute to water quality problems by altering natural flow patterns.

a) Increased levels of **salinity** in surface and ground water supplies can require additional treatment for particular industrial uses to produce water suitable for the product.

b) The **low** water levels of **Delta inflows** can exacerbate water quality problems.

3. **Other parameters** of concern and institutional arrangements may contribute to the difficulty in maintaining adequate water quality for industrial uses.

a) The **complex** array of **water quality standards** for a wide variety of uses (drinking water, agriculture, aquatic habitat, recreation, and industrial uses) can increase the difficulty in maintaining water quality for all beneficial uses.

D. **Water quality** is often inadequate for water-contact **recreational** (swimming, water skiing, etc.) needs as shown below:

1. Increased **nutrients and particulates** in the water affect recreational water quality conditions.

a) Increased **nutrient levels** can trigger algae blooms which result in taste and odor problems.

b) Increased **toxicity of suspended sediments** may pose an increased health risk to recreationists.

2. Increased levels of **pollutants and metals** in the water and in biota may adversely affect human health.

a) The presence of **pesticide** residues may adversely affect human health.

b) The presence of **herbicide** residues may adversely affect human health.

c) The presence of **hydrocarbon** residues may adversely affect human health.

d) The presence of **heavy metals** may adversely affect human health.

e) The presence of **dioxin** may adversely affect human health.

f) The increased risk of **hazardous material spills** into waters used for recreation may impact recreational activities and human health.

3. The large quantities of **Delta water used** within and outside of the Delta contribute to water quality problems by altering natural flow patterns.

a) The **low** water levels of **Delta inflows** can exacerbate water quality problems.

4. **Other parameters** of concern in the water as well as institutional arrangements contribute to the difficulty of maintaining adequate water quality for recreational uses.

   a) Increased concentrations of **pathogens** (virus, bacteria, protozoa, etc.) will increase health risks to water-contact recreationists.

   b) The presence of **asbestos** fibers are of concern to human health.

   c) The **complex** array of **water quality standards** for a wide variety of uses (drinking water, agriculture, aquatic habitat, recreation, and industrial uses) can increase the difficulty in maintaining water quality for all beneficial uses.

E. **Water quality** is often inadequate for **environmental** needs (see Ecosystem Quality section) as shown below:

1. Increased particulates and an imbalance of **nutrients** in the water affect aquatic habitat and organisms.

   a) An adequate **nutrient** (nitrogen, phosphorus, etc.) balance is important to different organisms; the balance differs between organisms.

   b) Increased levels of **suspended solids** adversely impact aquatic organisms.

   c) Increased **toxicity of suspended sediments** may pose an increased risk to habitat and organisms.

2. Increased levels of **pollutants and metals** in the water may directly harm aquatic habitat and organisms.

   a) The presence of **pesticide** residues may adversely affect aquatic and wetland species.

   b) The presence of **herbicide** residues may adversely affect aquatic and wetland species.

   c) The presence of **hydrocarbon** residues may adversely affect aquatic and wetland habitat and organisms.

   d) The presence of **heavy metals** may adversely affect aquatic and wetland species.

   e) The presence of **dioxin** may adversely affect aquatic and wetland species.

   f) The increased risk of **hazardous materials spills** may impact ecosystems.

3. The large quantities of **Delta water used** within and outside of the Delta contribute to water quality problems by altering natural flow patterns.

   a) A change in the balance of **salinity** levels will change areal extent of habitats and species.

   b) Increased **temperature** levels will impact aquatic habitat and organisms and may increase the production of algae.

   c) The **low** water levels of **Delta inflows** can exacerbate water quality problems.

4. **Other parameters** of concern and institutional arrangements contribute to the difficulty of maintaining adequate water quality for environmental uses.

   a) Decreased levels of **dissolved oxygen** may have an adverse impact on aquatic habitat and organisms.

   b) **Water quality standards** to meet one beneficial use may be in conflict with another beneficial use.